

## CLAIMS:

1. An interrogation system (100) comprising:
  - a station (101) for obtaining a quantity (103) of a passive device (102) by interrogating the passive device (102), the station (101) comprising:
    - transmitting means (104) for transmitting an electromagnetic pulse (105);
    - 5 - receiving means (106) for receiving, from the passive device (102), a modulated ultra-wideband reflection (107) of the electromagnetic pulse (105);
    - demodulating means (108) for demodulating the reflection and obtaining the quantity (103), the demodulating means (108) being coupled to the receiving means (106), and
  - 10 - the passive device (102) for transmitting the modulated ultra-wideband reflection (107) to the station (101), the passive device (102) comprising a cavity (109) for modulating the reflection (107) in dependence upon the quantity (103), the cavity (109) having a physical property (110), the physical property (110) being dependent on the quantity (103).
- 15 2. An interrogation system (100) as claimed in claim 1, characterized in that the passive device (102) has an identity (111), the passive device (102) being further arranged to modulate the reflection in dependence upon the identity (111), the demodulating means (108) being further arranged to obtain the identity (111) from the reflection.
- 20 3. An interrogation system (100) as claimed in claim 1, characterized in that the cavity (109) has physical dimensions (112), the quantity being determined by the ratio of at least two of the physical dimensions (112).
- 25 4. An interrogation system (100) as claimed in claim 1, characterized in that the demodulating means (108) comprise spectral component analysis means (113) for obtaining a spectral component of the reflection (107), the spectral component analysis means (113) being coupled to the receiving means (106).

5. An interrogation system (100) as claimed in claim 4, characterized in that the spectral component analysis means (113) comprise:
- an A/D converter (115) for converting the received reflection into a digital signal, the A/D converter (115) being coupled to the receiving means (106), and
  - 5 - a Fourier transformer (117) for performing a Fourier transform on the digital signal.
6. An interrogation system (100) as claimed in claim 1, characterized in that the demodulating means (108) comprise a replica (118) of the cavity (109).
- 10 7. An interrogation system (100) as claimed in claim 1, characterized in that the electromagnetic pulse (105) comprises a light beam (119), and the passive device (102) comprises a non-linear optical unit (120) for transforming the light beam (119) into the ultra-wideband reflection (107).
- 15 8. A station (101) for use in the interrogation system (100) as claimed in any one of claims 1 to 7.
- 20 9. A passive device (102) for use in the interrogation system (100) as claimed in any one of claims 1 to 7.
10. A method of obtaining a quantity (103) of a passive device (102) with a cavity (109) having a physical property (110) by interrogating the passive device (102), the method comprising the steps of:
- 25 - transmitting an electromagnetic pulse (105) to the passive device (102);
  - receiving a modulated ultra-wideband reflection (107) of the electromagnetic pulse (105) as modulated by the cavity (109) in dependence upon the physical property (110) being affected by the quantity (103);
  - demodulating the modulated ultra-wideband reflection (107) received; and
  - 30 - obtaining the quantity (103).